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NOTES ON GEOGRAPHIC DISTRIBUTION

Amphibia, Anura, Centrolenidae, *Chimerella mariaelenae* (Cisneros-Heredia and McDiarmid, 2006), *Rulyrana flavopunctata* (Lynch and Duellman, 1973), *Teratohyla pulverata* (Peters, 1873), and *Teratohyla spinosa* (Taylor, 1949): Historical records, distribution extension and new provincial record in Ecuador

Diego F. Cisneros-Heredia

Universidad San Francisco de Quito, Colegio de Ciencias Biológicas & Ambientales, calle Diego de Robles y Ave. Interoceánica, Campus Cumbayá, Edificio Darwin, DW-010A, Quito, Ecuador.

King's College London, Department of Geography, Strand, London, United Kingdom.

E-mail: diegofrancisco_cisneros@yahoo.com / diegofrancisco.cisneros@gmail.com

The Natural History Museum (BMNH) at London, UK, houses an important and historic collection of amphibians and reptiles from Ecuador that includes many types and some of the first specimens collected in the country. During the past months I studied the collection of Centrolenidae deposited at the BMNH and found different specimens of glassfrogs that provide interesting information about this little-known group of endangered amphibians, including historical records of species just recently reported from the country, distribution extensions, and new provincial records.

***Chimerella mariaelenae* (Cisneros-Heredia & McDiarmid, 2006):** This species was recently described based on one specimen collected in Cloud forests on the eastern slopes of the *Cordillera Oriental*, province of Zamora-Chinchipe, Andes of Ecuador (Cisneros-Heredia and McDiarmid 2006). *Chimerella mariaelenae* was later reported from three different localities in Low-Montane forests on the provinces of Napo and Tungurahua (Cisneros-Heredia and Guayasamin 2006; Cisneros-Heredia and McDiarmid 2007) and was collected at one locality in Cloud forests on the province of Morona-Santiago (*Museo de Zoología, Pontificia Universidad Católica del Ecuador*, QCAZ 31643, collected at the town of 9 de Octubre, 1670-1715 m above sea level - a.s.l.; Fig. 1). Herein I report what is probably the first specimen of *C. mariaelenae* to reach a scientific collection. Specimen BMNH 1912.11.1.67 was collected at "El Topo, R. Pastaza, E. Ecuador, 4,200 ft" = El Topo river, an affluent of the Pastaza river, ca. 1400 m a.s.l., by M. G. Palmer in 1912 (Fig. 1). Apparently, it was collected together with the holotype of *Nymphargus cochranae* (Goin 1961) and two specimens of *Rulyrana flavopunctata* (see below). It is an adult female (snout-vent length, SVL = 20.3 mm) with large cream-colored oviductal eggs. Structurally, it is very similar to the male holotype, including the dorsal pattern with dark punctuations and larger flecks, the truncate snout, and iridophore layers covering the pericardium, hepatic and gastrointestinal peritonea but absent on the parietal peritoneum. Due to preservation artifacts, the general background coloration is olive-green, which seems to be due to the fluid used to preserve the specimen by the BMNH at the time. *Chimerella mariaelenae* seems to be continuously distributed across the Low Montane Evergreen and Cloud forests across the eastern slopes of the *Cordillera Oriental* of Ecuador (Cisneros-Heredia and McDiarmid 2006; Cisneros-Heredia and Guayasamin 2006; Cisneros-Heredia and McDiarmid 2007; this publication), and may also occur in southern Colombia due to habitat continuity.

***Rulyrana flavopunctata* (Lynch & Duellman, 1973):** This species is currently known in Ecuador from several localities in Foothill Evergreen and Low Montane Evergreen forests across the northern Amazonian provinces of Sucumbíos, Napo, Orellana, and Pastaza (Lynch and Duellman 1973; Cisneros-Heredia and McDiarmid 2006; 2007) and it was recently collected in the province of Morona-Santiago

(QCAZ 27356-58 collected at 6.8 km N of the town of Limon, ca. 980 m a.s.l.; QCAZ 32265 at the town of 9 de Octubre, 1670-1715 m a.s.l.; Fig. 2). Here I report what are apparently the first specimens of *R. flavopunctata* to reach a scientific collection. Specimen BMNH 1913.6.24.4 was collected at "Zamora, 3250 ft, E. Ecuador" = Zamora, 1080 m a.s.l., province of Zamora-Chinchipe, by C. Carrión in 1933 (Fig. 2). It is a first provincial record and the southernmost record for the species, extending its range ca. 140 km S from the previous known closest locality (6.8 km N of the town of Limon, Morona-Santiago). Two specimens, BMNH 1912.11.1.69-70, were collected at "El Topo, R. Pastaza, E. Ecuador, 4,200 ft" = El Topo river, an affluent of the Pastaza river, ca. 1400 m a.s.l., province of Tungurahua, by M. G. Palmer in 1912. They provide the first locality for the species in the province of Tungurahua and were collected together with the holotype of *Nymphargus cochranae* (Goin, 1961) and one specimen of *Chimerella mariaelenae* (see above). *Rulyrana flavopunctata* seems to be continuously distributed across Foothill Evergreen and Low Montane Evergreen forests on the eastern slopes of the *Cordillera Oriental* of Colombia and eastern slopes of the Cordillera Oriental of Ecuador (Lynch and Duellman 1973; Cisneros-Heredia and McDiarmid 2006; 2007; Lynch 2006; this publication), and may also occur in northern Peru due to habitat continuity of foothill forests.

The two specimens from the province of Tungurahua slightly differ from other known conspecific specimens by having less-dense melanophores on the dorsal surfaces of the body, fingers, and toes (which produces a light lavender coloration instead of the purplish coloration observed in most specimens); they also exhibit less hand and foot webbing (see Table 1), which is herein interpreted as intraspecific variation. Otherwise they match all other morphological characters known for *R. flavopunctata*. However, further research should be conducted as cryptic taxa may occur within the highly-variable and widely-distributed *R. flavopunctata*.

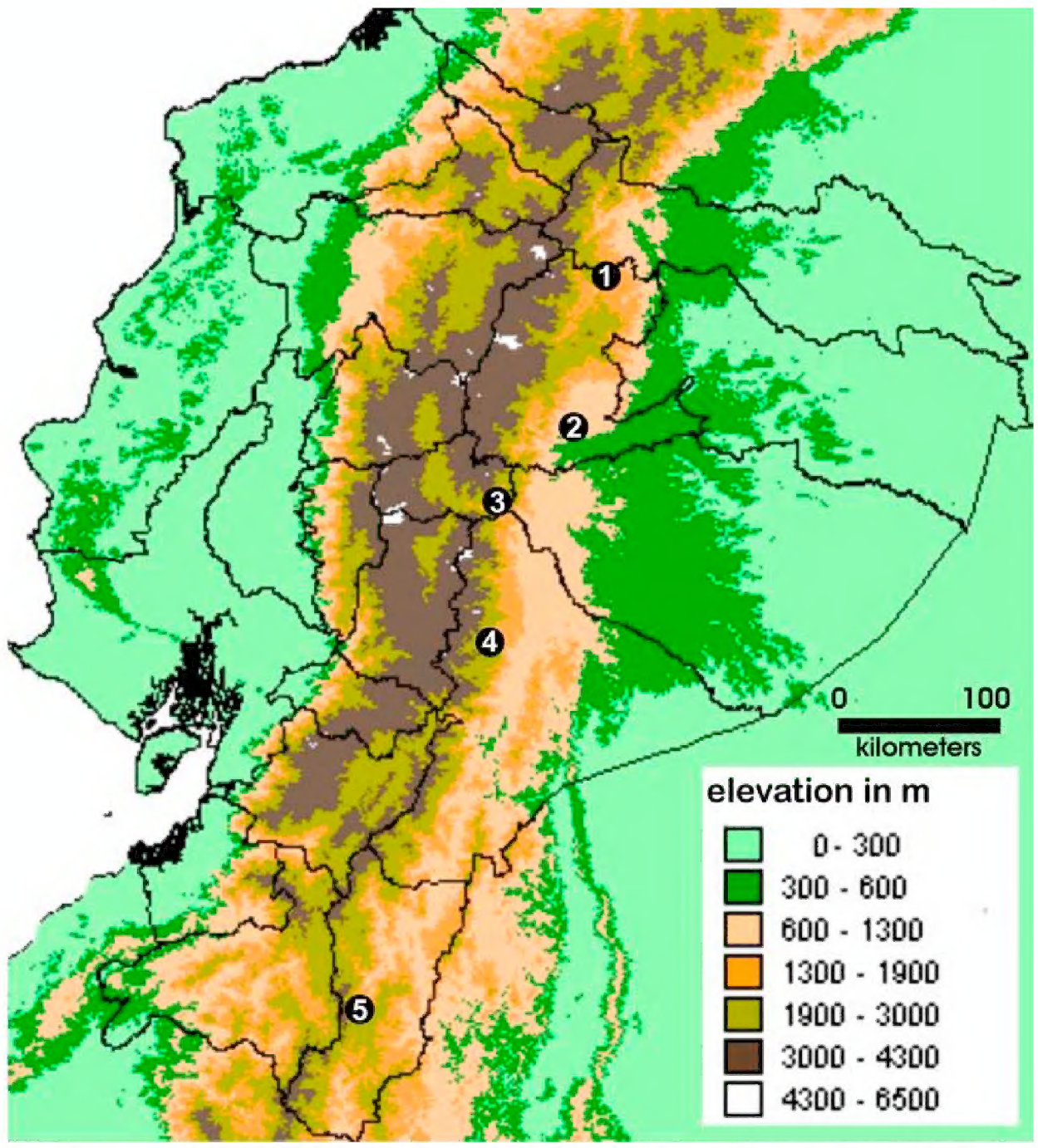

Figure 1. Known localities of *Chimerella mariaelenae* in Ecuador. Province of Napo: 1 = *Cascada de San Rafael*; 2 = Hollín river. Province of Tungurahua: 3 = points to two nearby localities, Negro river and El Topo river. Province of Morona-Santiago: 4 = town of 9 de Octubre. Province of Zamora-Chinchipe: 5 = western slope of *Contrafuerte de Tzunantza*, (type locality).

***Teratohyla pulverata* (Peters, 1873):** This species was recently reported from Ecuador, based on specimens collected at six localities in the Lowland Non-Seasonal Evergreen forests on the northwestern lowlands, in the provinces of Esmeraldas and Pichincha (Bustamante et al. 2007). Four specimens of *T. pulverata* deposited at the BMNH correspond to the first Ecuadorian specimens to reach a scientific collection. Specimens BMNH 1902.5.27.24-25 were collected at "R. Durango, 350 ft., N. W. Ecuador" = Durango river, ca. 110 m a.s.l., province of Esmeraldas (specimen BMNH 1902.5.27.24 is the type of *Centrolenella petersi* Goin, a synonym of *T. pulverata*); BMNH 1902.7.29.36-37 were collected at "Rio Sapayo, N. W. Ecuador, 450 ft" = Zapallo river, ca. 150 m a.s.l., province of Esmeraldas (Fig. 2). *Teratohyla pulverata* occurs from eastern Honduras to Panama (Caribbean versant) and from Costa Rica to northwestern Ecuador (Pacific versant; Savage 1967; Savage and Starrett 1967; Ruiz-Carranza et al. 1996; Ibañez et al. 1999; Köhler 2001; McCraine and Wilson 2002; Savage 2002; Kubicki 2007; Bustamante et al. 2007; Cisneros-Heredia and McDiarmid 2007; this publication).

***Teratohyla spinosa* (Taylor, 1949):** This species was first reported from Ecuador by Duellman and Burrowes (1989) from specimens collected at the province of Los Ríos. It was later reported from the provinces of Pichincha and Esmeraldas by Cisneros-Heredia and McDiarmid (2005; 2007). One specimen deposited at the BMNH, collected at "Salidero, nw. Ecuador, 350 ft" = Salidero, near Bulún, Bogota river, ca. 110 m. a.s.l. (Fig. 2), province of Esmeraldas, corresponds to the first Ecuadorian specimen to reach a scientific collection and a new locality in the province of Esmeraldas, filling the gap between Colombian and Ecuadorian localities. *Cochranella spinosa* occurs from northeastern Honduras to Panama (Caribbean versant) and from Costa Rica to northwestern Ecuador (Pacific versant; Savage 1967; Savage and Starrett 1967; Ruiz-Carranza et al. 1996; Ibañez et al. 1999; McCraine and Wilson 2002; Savage 2002; Kubicki 2007; Cisneros-Heredia and McDiarmid 2005; 2007; this publication).

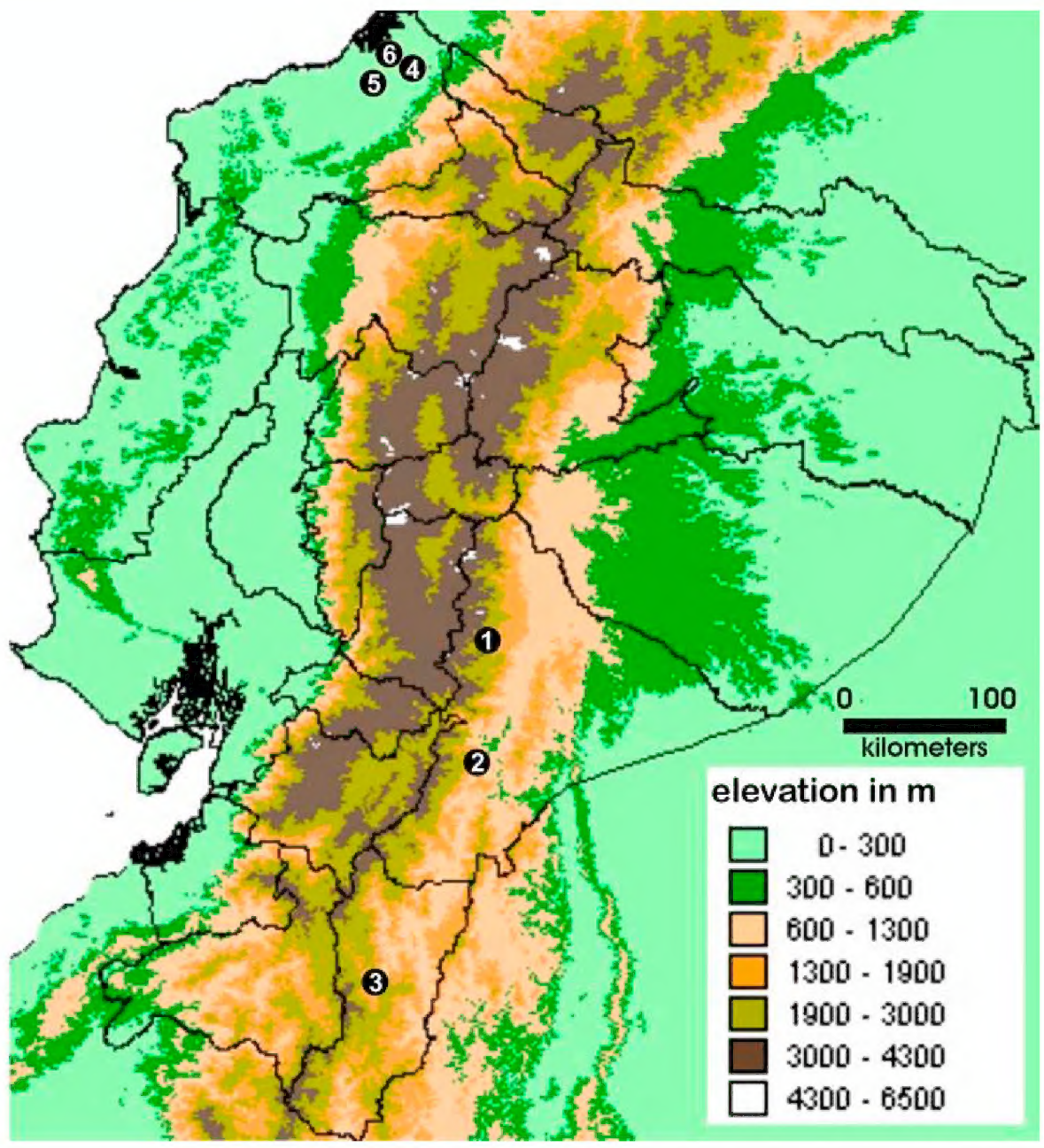

Figure 2. Historical localities of *Rulyrana flavopunctata* (1–3), *Teratohyla pulverata* (4–5), and *Teratohyla spinosa* (6) in Ecuador, based on material deposited at the Natural History Museum (BMNH), London, UK. Province of Morona-Santiago: 1 = town of 9 de Octubre; 2 = 6.8 km N of the town of Limon. Province of Zamora-Chinchipe: 3 = Zamora. Province of Esmeraldas: 4 = Durango river; 5 = Zapallo river; 6 = Bogotá river.

Table 1. Hand and foot webbing variation in three species of *Rulyrana flavopunctata* deposited at the Natural History Museum (BMNH), London, UK.

Specimen	Hand webbing	Foot webbing
BMNH 1912.11.1.69 (11)*	Basal between I and II, II $2^{\bar{A}}$ – 4 III 2^{+} – 2 IV	I 1^{+} – 2 II 1– $2^{1}/_{2}$ III 1 – $2^{1}/_{3}$ IV $2^{1}/_{3}$ – 1^{+} V
BMNH 1912.11.1.70 (12)*	Basal between I and II, II $2^{\bar{A}}$ – 4 III 2 – $2^{\bar{A}}$ IV	I 1^{+} – 2 II $1^{\bar{A}}$ – 2 III 1 – $2^{\bar{A}}$ IV $2^{\bar{A}}$ – 1^{+} V
BMNH 1933.6.24.4	Basal between I and II, II $1^{1}/_{2}$ – 3 III $1^{1}/_{2}$ – 1^{+} IV	I 0^{+} – 1 II 0^{+} – $1^{1}/_{2}$ III 1 – $1^{1}/_{2}$ IV $2^{1}/_{2}$ – $1^{\bar{A}}$ V

* Both specimens are in a container tagged BMNH 1912.11.1.69-70, however there is no indication about which one is 69 or 70 in the flask or in the BMNH catalogue; instead the specimens are individually tag with the numbers 11 and 12. I herein use the number BMNH 1912.11.1.69 for the specimen tagged with #11 and BMNH 1912.11.1.70 for the adult female tagged with #12.

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